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NOTES ON SOME FORMS OF OREOHELIX STRIGOSA (Gould)*

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Fifty years ago Henry Hemphill collected large numbers of *Oreohelix* from which he described many species, varieties, and forms. He was the pioneer in the areas where this genus dominates the land-shell fauna. In addition to finding many novelties he devised a scheme of classification that called for a distinct name for the several variants in the same species, sometimes in the same colony. Even aberrant color forms such as albinos were given names by him. Representatives of most of his material with notes and descriptions were sent to W. G. Binney from time to time, and later "sets" were variously distributed.[1] It is clear from an examination of some of the lots thus sent that he did not use very great care in making the selections; some of this semi-commercial material definitely does not agree with the type lots that he held in his own collection. Binney

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[1] See Henderson & Daniels, Proc. Acad. Nat. Sci. Philadelphia, 1916: 315-316, for an account of some of these sets.

illustrated a few of the named forms, but in the majority of cases the figures are too poor to aid much in identification.

Hemphill's descriptions were rather generalized. As a consequence, his names have been obstacles to every worker in *Oreohelix* since his time. Various interpretations have been made and some clarification has taken place but uncertainty still pertains to many.

In 1931 one of us (A. G. S.) made a collecting trip through eastern Oregon, Washington, and western Idaho and some material of the *O. strigosa* group was collected. Upon attempting to identify these shells recourse was had to comparisons with specimens in the original Hemphill collection, now in the California Academy of Sciences and excellently arranged for consultation. We were at once impressed with the difficulties under which other workers must labor who do not have the original collection available; and we decided that it would be desirable to present adequate illustrations of Hemphill's type specimens of all of the named forms from the area concerned.

Very little has been learned by us about the details of the methods used by the great collector in assembling his material or disposing of it subsequently, as none of his correspondence accompanied the collection to the Academy. It is evident, however, from his original catalogs and his sorting and numbering, that he kept his largest suites and his best specimens for his own collection. He sorted his lots in various ways and gave separate numbers to each segregation. Those to which he gave distinct names are so labelled, and often a particular lot will have "Types" written on the label in his handwriting.

The wealth of material in the collection is such that we feel justified in presenting rather complete information on all of the named forms from the northwestern part of the range of the genus. Except for the Hemphillian forms, we have not attempted to present a complete review of the species. Henderson has given an adequate synonymy and no useful object would be gained by repeating it[2]. More recently Pilsbry[3] has contributed an excellent review of the group, based largely on anatomical characters, as well as the shells. This represents the latest word toward an authoritative classification and includes a catalog of all of the species of the genus.

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[2] Henderson, Junius. Univ. Colorado Studies, **13**, 2, 1924 and **17**, 2, 1929.

[3] Pilsbry, H. A. Proc. Acad. Nat. Sci. Philadelphia, **85**: 383-410, pls. 14, 15. March 3, 1934.

1. Oreohelix strigosa (Gould)

Plates 33, 34, 35

Helix strigosa Gould, Proc. Boston Soc. Nat. Hist. **2**:166, 1846.—Gould, U. S. Explor. Exp. Moll. 1852, p. 36; Atlas 1856, pl. 3, figs, 41, 41a, 41b.—Binney, Terr. Moll. **2**:210, 1851; **3**:1857, pl. 26a, 3 figures.

Patula strigosa (Gould), Binney, W. G., Terr. Moll., **5**, (Bull. Mus. Comp. Zool. Harvard College, **4**):157, 1878, fig. 64 (lower), fig. 65 (upper) both as *P. cooperi:* pl. 4, fig. H [dentition]; pl. 11, fig. A [genitalia]. [Identity of dentition and genitalia doubtful.]—Binney, 2nd Suppl. Terr. Moll., **5**, (Bull. Mus. Comp. Zool. Harvard College, **13**, **2**:26–34, 1886. [Contains discussion of the group and (pl. 2, fig. 10) a figure of an Oregon specimen.]

Oreohelix strigosa (Gould), Henderson, Univ. Colorado Studies, **17**, 2:88–89, 1929. —Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:383–384, pl. 14, figs. 2–11, 28–31; pl. 15, fig. 13, 1934.—Smith, Nautilus, **50**, 3:73–77, Jan. 1937.

Proper evaluation of the Hemphillian shells and the collections made in 1931 led to an investigation of the circumstances surrounding the discovery of the species which has already been published. (See last reference above.) Although partly based on circumstantial evidence, the conclusion drawn was that the type locality of *Oreohelix strigosa* is in the valley of the Columbia River not far from the mouth of the Entiat River, north of Wenatchee, Chelan County, Washington.

A series of shells from this locality was sent to William B. Marshall of the U. S. National Museum, who compared them with Gould's type specimen, (U. S. Nat. Mus. No. 5441). Mr. Marshall found the set to be very similar and, from the lot, he returned a single shell which he stated was extremely close, especially in coloration, but which showed a somewhat rounder and less oblique aperture. This shell, (C. A. S. No. 5843) is shown on plate 33, figures 1–3, and came from Entiat, Washington; diam. 21.5 mm., alt. 11.0 mm. Figures 4–6 of the same plate represent a larger specimen from rock slides four miles north of Entiat; diam. 23.7 mm., alt. 11.4 mm. Among 15 additional specimens from Entiat the largest and smallest in diameter are 25.8 mm. and 21.8 mm. respectively, while the highest and lowest are 13.4 mm. and 11.1 mm. respectively. The average is, diam. 23.8 mm., alt. 12.4 mm. Among 10 specimens from four miles north of Entiat the largest is 27.2 mm. in diameter and the smallest 22.4 mm.; greatest altitude, 14.0 mm. and least 10.9 mm. The average is, diam. 24.6 mm.; alt. 12.4 mm.

The living specimens in the lot from Entiat were kept alive for some time, and many of them gave birth to a number of young, which were dark horn-color, consisted of about two and one-half whorls, and measured from 4.0 to 4.8 mm. in diameter. Sculpture is absent on the first whorl, then spiral lines appear, which gradually merge into a few spiral ridges on the last half turn. All of the young are low-spired, being almost planulate, and all are strongly keeled.

Color variation among the adult shells is considerable, as might be expected. The predominant color-form has a ground of grayish white on which are superimposed two well-defined, dark chestnut bands, the wider and more strongly colored one just below the periphery, the other about half way between the periphery and the suture of the last whorl. The upper band usually is discontinuous and indistinct on the early whorls. Bands on the base vary from two or three well-marked hair lines of chestnut-brown to about the same number of wider but less distinct bands. A few shells (three or four in the lot from Entiat) have no bands above and are darker than the rest, being generally suffused with chestnut. The banding below is either distinct or else clouded with chestnut color on this form, which approximates that existing on the type specimen in the National Museum.

From the above it would seem logical to assume that the original specimen of *O. strigosa* was collected in the valley of the Columbia River, not far from where the Entiat River enters it, and this is accordingly designated the type locality.

The set taken at Entiat consists of 39 full grown, adult shells or nearly so, and 12 immature specimens. Four miles north of Entiat a set of 13 adults and 5 young shells were taken. These average somewhat larger and heavier than the lot from Entiat, and contained more of the darker colored shells without pronounced banding.

Hemphill referred nine varieties from Oregon, Washington and Idaho to *strigosa*. In chronological order these are *bicolor*, *subcarinata*, *lactea*, *jugalis*, *intersum*, *parma*, *fragilis*, *picta* and *castanea*. Henderson described *castanea* as a distinct species which, however, Pilsbry later referred to *strigosa* as a subspecies. The latter also considered *fragilis* to be a subspecies. Furthermore, he described the subspecies *goniogyra* and *delicata* from near Riggins, Idaho and Milton, Oregon, respectively, and the species *junii* (in a different group of *Oreohelix*) from the Grand Coulée, Washington. Specimens representing the last three names have not been critically examined in connection with the preparation of the present review, but a study of the original type lots of the Hemphill material has convinced us that *bicolor*, *subcarinata*, *lactea*, *jugalis*, *parma* and *picta* are strictly synonymous with *strigosa* and are not recognizable, even as varieties. The remaining three of the Hemphill segregation, *intersum*, *fragilis* and *castanea* (=*variabilis*) are believed to be distinct species. This last conclusion, however, is subject to the uncertainty always involved when nothing is known of the field relationships, anatomy and life history of the species. Representatives of each of the nine names listed have been selected for illustration herewith in order to assist in the stabilizing of the nomenclature of the group and, it may be added, the Academy series are maintained intact as Hemphill segregated them. Notes on these lots follow.

Oreohelix strigosa subcarinata (Hemphill)

Plate 34, figures 4, 5, 6

Patula strigosa var. *subcarinata* Hemphill, Nautilus, **3**, 133, April, 1890. "Rathdrum, Idaho."—Binney, 3rd Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. Harvard College; **19**, 4) :215, May, 1890, text fig.—Binney, 4th Suppl. (B. M. C. Z. **22**, 4) Jan. 1892, p. 171. [Reprint of notes in above papers.]—Pilsbry, Man. Conch. ser. 2, **8**:118, Feb. 25, 1893, pl. 41, fig. 96.

Oreohelix strigosa form *subcarinata* Hemphill, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:386, 1934, pl. 14, figs. 28–30; "Rathdrum, Idaho, paratypes."

The variety *subcarinata* is represented in the Hemphill collection at the California Academy of Sciences by six lots of shells, labelled by the collector; five lots are from "Rathdrum, Idaho," and one is merely marked "Idaho." No type or "types" were designated. In the 3rd Supplement, Binney gave the locality as "Old Mission, Coeur d'Alene, Idaho," but there is nothing in the collection or in Hemphill's notes to indicate that this is correct.

In 1893 Pilsbry selected the specimen figured by Binney (3rd Suppl. 1890, p. 215) as the "type" and in 1934 he designated the three specimens he then figured as "paratypes."

Nineteen shells from Rathdrum, Idaho (Hemphill's numbers, 7627, 7629, 7631–7633) vary from 22.0 mm. to 29.7 mm. in diameter and from 14.8 mm. to 20.5 mm. in altitude; the average is, diam. 25.2 mm.; alt. 17.3 mm.

Oreohelix strigosa jugalis (Hemphill)

Plate 35, figures 1, 2, 3

Patula strigosa var. *jugalis* Hemphill in Binney, 3rd Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. **19**, 4) May, 1890, p. 215, text fig. "Banks of Salmon River, Idaho."—Hemphill, Nautilus, **3**:134, 1890.—Binney, 4th Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. **22**, 4) Jan., 1892, p. 169.—Pilsbry, Man. Conch. ser. 2, **8**:117, 1893, figs. 93–95.

Oreohelix jugalis Hemphill, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:398.

The variety *jugalis* is represented in the collection by three lots labelled by Hemphill from "Salmon River Mountain, Idaho." None of the specimens are as deformed as the one figured by Binney in the "3rd Supplement," but all show a tendency toward a depressed body whorl. The same feature, however, is displayed to some extent by Gould's original figure of *strigosa*. It is believed that Hemphill used the name *jugalis* as a receptacle for those individuals showing the most pronounced tendency toward depression of the aperture.

In 1934 Pilsbry recognized this form as a distinct species because of the "very wide umbilicus, the closely approaching upper and columellar margin of the peristome, which is occasionally continuous, and the weak or obsolete spiral sculpture." He chose specimen No. 62372 (A. N. S. P.) as lectotype and Lucile, Idaho as the type locality.

The shells in the three lots mentioned (Nos. 7700–7702 H. H. coll.) range in diam. from 17.2 mm. to 24.8 mm. and in alt. from 9.0 mm. to 13.5 mm.; the average is, diam. 20.9 mm.; alt. 11.4 mm. These shells are so similar to *strigosa* and intergradation is so complete that we have been obliged to refer them to that name. Since Hemphill's description may be presumed to have been based upon this material with reasonable assurance, at least in part, we feel justified in calling the specimen selected for illustration a "syntype." This action is in accordance with the definition of the term as adopted by Frizzell[4]. If at a later date, additional study should show that our reference of the series here considered, to *strigosa* as a synonym is wrong and that, in fact, it is distinct from that form as well as from the one Dr. Pilsbry called *jugalis* and for which he properly designated a lectotype, then this series would presumably require a new name.

Oreohelix strigosa bicolor (Hemphill)

Plate 35, figures 7, 8, 9

Patula strigosa var. *bicolor* Hemphill, Nautilus, **3**:133, 1890. "Rathdrum, Idaho." —Binney, 4th Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. Harvard College, **22**, 4), Jan. 1892, p. 172, pl. 4, fig. 7.—Pilsbry, Man. Conch. ser. 2, **8**:118, 1893, pl. 41, figs. 3, 4.

Oreohelix strigosa subcarinata plus *bicolor* Hemphill, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:386, 1934.

Hemphill stated that this was merely a color form of his var. *subcarinata*, the prevailing pattern being blotches of a dark horn shade interspersed with dirty white. No bands are present. He left 15 specimens definitely labelled *bicolor* and most of these answer the description fairly well. Many of the shells show intergradation with what he selected as *subcarinata*. They bear numbers 7634, 7635 and 7636, (H. H.). The variation in diam. is 18.6 mm. to 27.6 mm. and in alt. 12.1 mm. to 19.7 mm., the average being diam. 24.0 mm.; alt. 16.0 mm.

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[4] Frizzell, D. L. Terminology of types. American Midland Naturalist, **14**, 6: 637-668, 1933.

Oreohelix strigosa lactea (Hemphill)

Plate 35, figures 4, 5, 6

Patula strigosa var. *lactea* Hemphill, Nautilus, **3**:134, 1890. "Rathdrum, Idaho."—Binney, 4th Suppl. Terr. Moll. **5** (Bull. Mus. Comp. Zool. Harvard College, **22**, 4), Jan. 1892, p. 172, pl. 4, fig. 8.—Pilsbry, Man. Conch. ser. 2, **8**:118, 1893, pl. 41, fig. 99.

Oreohelix strigosa subcarinata form *lactea* Hemphill, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:386, 1934.

This name was applied to a series of albinistic shells. It is not quite clear from Hemphill's note whether he found a colony of these milk-white shells without admixture of other normal ones, but that might be inferred. He left two lots (No. 7637, 5 sp., No. 7638, 4 sp.) in his collection labelled *lactea*. The first, marked "Types," is from "Rathdrum, Idaho;" these vary in diameter from 23.5 mm. to 28.5 mm. and 17.0 mm. to 21.2 mm. in altitude, the average being, diam., 26.4 mm., alt. 18.6 mm.

Under No. 7638, he recorded a set of four white shells from Salt Lake City, Utah, as *Helix strigosa* var. *lactea;* we have not attempted to place these exactly because they were not mentioned in the original description of the variety.

Oreohelix strigosa parma (Hemphill)

Plate 33, figures 7, 8, 9; plate 34, figures 1, 2, 3

Patula strigosa var. *parma* Hemphill, Nautilus, **4**:17, 1890. "Near Spokane Falls, Washington."—Binney, 4th Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool., **22**, 4), Jan. 1892, p. 173.—Pilsbry, Man. Conch. ser. 2, **8**:117, 1893, pl. 42, figs. 7, 8, 9.

Oreohelix strigosa form *parma* (Hemphill), Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:384, 386, 409, 1934, pl. 14, fig. **1** [synonymous with *strigosa*].

Hemphill left two lots (7625, 7626 H. H.) labelled *parma* and these are believed to be close to the original *strigosa*. There is considerable variation in the series, with no two shells being exactly alike. Actually very few conform to the original description, but those chosen as syntypes and figured herewith are closest. Variation in diameter is from 22.1 mm. to 27.8 mm. and in altitude from 13.0 mm. to 14.8 mm., the average of 10 being, diam. 24.7 mm.; alt. 13.8 mm.

How it was possible for Hemphill to justify his separation of these shells from what he called *subcarinata* is difficult to determine; the two series seem to us to show perfect intergradation. Pilsbry stated in 1934 that the specimen he then illustrated was a paratype of the form *parma* and also that it was strictly synonymous with *strigosa*.

Oreohelix strigosa picta (Hemphill)

Plate 34, figures 7, 8, 9

Patula strigosa var. *picta* Hemphill, Nautilus, **4**:16, 1890. "Rathdrum, Idaho." —Binney, 4th Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool., **22**, 4), Jan. 1892, p. 175.—Pilsbry, Man. Conch. ser. 2, **8**:118, 1893, pl. 41, figs. 1, 2; [equals *subcarinata*].—Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:386, 1934, pl. 14, fig. 28, "type."

The Hemphill Collection contains one lot (5 specimens) labelled *Helix strigosa* var. *subcarinata picta;* it is obvious from his description and from the aspect of these shells themselves that he had in hand one of the color phases of his "*subcarinata.*" We have, therefore, selected from the series bearing that name the specimen for illustration that most closely conforms to the description. No other agrees with it in all details. Pilsbry stated in 1934 that the form was not distinct, and segregated specimen No. 62284 of the Philadelphia Academy as "type" [=lectotype]. This was evidently a part of some lot distributed by Hemphill. The five shells vary from 22.4 mm. to 28.8 mm. in diam., and 17.3 mm. to 19.4 mm. in alt.; the average being, diam. 24.6 mm. and alt. 18.3 mm.

2. Oreohelix intersum (Hemphill)

Plate 36, figures 1, 2, 3

Patula strigosa var. *intersum* Hemphill, Nautilus, **3**:135, 1890. "Banks of Little Salmon River, Idaho."—Binney, 4th Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. Harvard College, **22**, 4), Jan. 1892, p. 170.—Pilsbry, Man. Conch. ser. 2, **8**:117, 1893, pl. 41, figs 91, 92.

Oreohelix jugalis intersum Hemphill, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:398, 406, 1934.

The two lots of measured specimens (Nos. 7616, 7618 H. H.) were recorded by Hemphill with the following note: "Shell faintly subcarinate; fine riblike striae." The lectotype has been selected from them because he mentioned the striae in his description, and this seems to be constant through the series. The character is so pronounced that for the present, we feel disposed to recognize the shells as specifically distinct from *strigosa* and from other named forms. Pilsbry, in 1934, considered the form to be a subspecies of *jugalis* which, however, cannot be separated from *strigosa* with the material we have available.

Under the name *intersum* Hemphill recorded five additional lots of specimens all separated under the heading: "Shell subcarinate, surface smooth." The lots are numbers 7620–7624 inclusive. No. 7620 is from Salmon River Mountains, Idaho, five specimens. These are smooth chestnut-colored shells with a white, peripheral band. No. 7621 (5 specimens) is from the same place and were separated because they were "depressed." We believe these two lots of shells

belong to a distinct species that has not yet been described, but we refrain from assigning a name at this time because of the indefiniteness of the locality. Numbers 7622 (7 sp.), 7623 (7 sp.), and 7624 (7 sp.), are from Box Elder County, Utah, and obviously belong to a species different from *strigosa*, *intersum*, or the one just discussed.

The ten specimens in lots 7617 and 7618 vary in diam. from 15.2 mm. to 19.9 mm. and in alt. from 8.9 mm. to 12.0 mm., the average being, diam. 17.5 mm. and alt. 10.6 mm.

3. "Oreohelix" fragilis Hemphill

Plate 36, figures 4, 5, 6

Patula strigosa var. *fragilis* Hemphill, Nautilus, **4**:17, 1890. "Near Franklin, Idaho, among red sandstone."—Binney, 4th Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. **22**, 4), Jan. 1892, p. 174.—Pilsbry, Man. Conch. ser. 2, **8**:117, 1893, pl. 41, figs. 5, 6.

Oreohelix strigosa fragilis Hemphill, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:408, 1934.

The collection contains five lots, 21 specimens, that Hemphill labelled *fragilis* from near Franklin, Idaho. Most of these shells are thin and somewhat translucent. They may reasonably be held as a distinct species as we have not been able to find intergradation with other forms. A specimen has been selected as lectotype and illustration that conforms as closely to the original description as possible. The 21 shells vary in diam. from 15.2 mm. to 19.9 mm., and in alt. from 9.5 mm. to 14.5 mm., the average being, diam. 18.6 mm.; alt. 14.0 mm. No. 7664 is sinistral.

All of these shells are brown in color and quite thin for *Oreohelix*. Two lots supplied by Professor Henderson, one from Franklin Butte west of Franklin, Idaho (7 sp.), and one from "east of Webster, Utah, sta. 39" (6 sp.), are much lighter in color. Those from the last locality are larger than any of Hemphill's *fragilis*. The dark brown color and the nature of the bands indicate a strong possibility that Hemphill's shells are a small race of *Anguispira*. Except for the small size, the thinness of the shells, and the absence of bands on some specimens we would hesitate to separate them more than subspecifically from *A. kochi*.

Professor Henderson's shells seem unquestionably specifically distinct from Hemphill's *fragilis* and the true generic relationship of the latter can probably only be stated when living material shall have been collected and dissected.

A small lot of a very pretty chestnut-brown colored *Oreohelix* close to *O. fragilis* was found by one of us (A. G. S.) in 1931 in rock slides in the valley of the Clearwater River, 12 miles south of Lewiston, Idaho. Many specimens in the lot were broken about the spire owing to the thinness of the shells, probably the work of rodents.

4. **Oreohelix variabilis** Henderson

Plate 36, figures 7, 8, 9

Patula strigosa castaneus Hemphill [in part], Binney, 2nd Suppl. Terr. Moll. **5**, (Bull. Mus. Comp. Zool. Harvard College, **13**, 2), 1886, p. 32.—Pilsbry, Man. Conch. ser. 2, **8**:116, 1893, pl. 41, figs. 84–85.

Oreohelix variabilis Henderson, Proc. Calif. Acad. Sci., ser. 4, **18**, 8:221–226, Apr. 5, 1929, pl. 24, figs. 2–4; "near Celilo, Oregon."

Oreohelix strigosa variabilis Henderson, Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, **85**:387–390, 1934, pl. 14, figs. 25, 26, text fig. 7.

Henderson has supplied all the information there is available regarding Hemphill's collections of this species. In the 1931 collections more than 400 specimens were obtained (by A. G. S.) among grass and under brush and stones on the Sherman County highway, southeast of Biggs, Oregon, which is on the Columbia River Highway about 20 miles east of The Dalles. As there had been a heavy rain the day before, the snails were on the surface in large numbers.

Variabilis is well named, being exceedingly variable in both size of shell and in coloration, which ranges from a whitish buff with hardly any darker color, to a deep brown with almost no lighter color. It is normally a maculated shell, the chestnut-brown color appearing as small flecks, as a discontinuous cloudiness, or in a few shells, as a general suffusion over both the upper and the lower surface. Generally the shells are bandless, although distinct narrow bands are found on the bases of a few of the darker shells. Suggestion of bands is rarely seen on the upper surface.

When found, nearly all of the animals contained fully matured young ranging from 5 to 15 in each shell. The entire lot was kept alive for several months and hundreds of young were born in the meantime. The newly-born young consist of about two whorls, all uniformly dark chestnut in color, strongly carinate, somewhat planulate above, and measure from 3.7 to 4.5 mm. in diameter, the larger ones being in the smaller clutches of young. Sculpture consists of fairly coarse growth-ribs on which are superimposed many fine, rather wavy, closely spaced spiral lines covering the entire two turns. These spiral lines are either obsolete, or lacking entirely on the later whorls of adult shells.

Another small lot of *variabilis* was collected in rock slides in the Columbia River Valley about three miles above Biggs. These were smaller and darker than those in the first lot.

The diam. of 20 of the first mentioned lot varies from 15.3 mm. to 21.3 mm. and the alt. from 10.0 mm. to 15.2 mm., the average being diam. 18.9 mm., alt. 12.9 mm.